

P.O. BOX 523

OWEGO, NEW YORK 13827

EDIT -the newsletter continues to grow as we try to squeeze as much as possible onto the six sheets of paper that the post office says we can mail for 22 cents. 6 sheets, if you did not know, is all we can mail, 1 more sheet and we have to add a 17 cent stamp! We do not have enough (about 110) to meet bulk mailing rates. Anyway, this revised format just adds two (2) full pages of text to your monthly newsletter! So read/enjoy!!

NEW - ads on pages 5 & 6 for "The English Micro Connection"

NEXT - meeting should be very exciting. If you've not been in while, stop by Wednesday night- Wes Brzozowski will bring in a newly arrived **MICRODRIVE** and **INTERFACE ZERO** (read pages 7 THRU 10 of this issue for the hardware details.) I have seen the microdrive in action, and it substantially increases the power of a TS2068. Being able to access very quickly other parts of a program or data or files you can do many things you can't do now. It is more important than the pure decrease in the time it loads a program. **TASWORD TWO** in 15-20 seconds! So even if you are not hot for the 2068 I hope you'll stop by because we can't ask people to transport expensive equipment. So take advantage of Wes' generosity and come and see this really neat addition to Sinclair computing. Thanks in advance, Wes.

THEN - don't overlook Charlie Koeth's part of the program -he has built a Speech Synthesizer (to go along with his clock) and he will be hauling that in for a demonstration. Hopefully there will be time to also demonstrate the telecommunications software package that Dave Schoenwetter has developed (see pg. 4). If not that will be on the schedule for the next meeting!

AND - if the above were not enough - the hardware class on Sat the 23rd (1 PM, Vestal Library!!!) will be a demonstration by Glenn Wilson on etching your own printed circuit board. Plus, a chance to review those initial soldering/wire wrapping fundamentals. If you think you might want to try an electronic project (even NOT computer related) stop by and let the experts help. I found the first class most informative- thanks Dennis

for the good teaching job. It has helped me get a fresh start on the printer interface designed by Dave Schoenwetter. I will keep at until it is DONE! John Sims had loaned me (many MANY months ago) his Aerco I/F so we could print SINCUS NEWS! He even bought one of the cases of printer paper last month!! So, John order your printer!!! Thanks, John - pick your Saturday night for one of Gary's gourmet beef fondue dinners!! Thanks so very much!! **** SCROLL OF THE SCREEN TO JOHN SIMS!

FOR -the TS1000 folks [we really do want to keep you active in SINCUS meetings!] Wes Brzozowski has promised to bring in his design for his keyboard that just plugs into the ZX81/TS1000. Noone has had enough time to verify how hard hooking the \$2.95 keyboard [see pg 2 Paul Hill's column] will be.

COPY - any programs submitted to newsletter onto tape, PLEASE! I appreciate your efforts, but believe me I do not have any spare time to type in code. I have both TS2068s and TS1000/ZX81s so I will try your program if it is on tape. It will help me a great deal, so thanks in advance.

INPUT - again from John Colonna [see page 11], plus a program that was too big for newsletter-I'll demo at meeting.

IF - calling me at home, expect my modem to answer!!!!

CONTINUE - to try to use CLONE and report the results. Wes has told me that he thinks it is a timing problem in the SAVE! He would like as much information as possible, so please try real programs of some size-the larger the program the more likely a problem may occur. The test is seeing if the "copy" loads OK.

FORMAT - for the back issues of SINCUS NEWS has been arranged for. Many thanks to Paul Hill who took time out from painting his kitchen to edit/format all back articles to 64 character columns and set them up on VU FILE not to mention the color coded labelling of the cassette cases!! A great job, Paul. Now we will continue to proceed in printing out the articles, some will be reedited and typos corrected. We want to arrange them by broad topics-ZX81/TS1000, hardware, reviews, etc. We will then formulate a projected "Sale Price" of producing them. I would ask a couple more people to step forward and help with the physical printing of the articles-using TASWORD and my printer. So, please be patient, this will be worth it!!

AT the April meeting we will be nominating for elections to be held at the May meeting, so have candidates in mind. We will try to keep the business part as brief as possible.

OVER the past two years we have published various listings of programs and routines. How about a couple members type in the code and save it to tape, and we'll produce a couple tapes of the things that have been listed in the newsletter.

SEE YOU AT THE MEETING ON THE 20th - THINK SPRING!!

GARY ENNIS, SINCUS
EDITOR - SINCUS NEWS

* * USER GROUP NEWS * *

We have a newsletter from SYNAPSE- first I've seen, apparently we have been mailing to SYNAPSE in Centre Hall, PA and they're in College Park, PA. Always glad to hear from more groups.

From Timex Sinclair Users Group, MILE HIGH CHAPTER, Aurora CO, comes word that one of their former members has been advertising under the name of "Microtech Marketing" several Dog and Horse racing programs and apparently some people have been ripped off. If you are one contact Postal Inspector.

LIST, of Long Island has another info filled newsletter and a couple programs by ours truly, Stan Livingston! Nazir Pashtoon of LIST has written some intersting articles on the 2068,micro-drives and EMU-1. They're in the newsletter library.

SINC-LINK, Toronto, Ontario has a lot of info on connecting the RGB monitors up, and opinions on the Sears Monitor.

TIMELINEZ, San Francisco, CA has devoted their December issue to an indexing of the past articles written and received by their group.

TRIANGLE Sinclair User Group, Carrboro, NC has another info I filled letter, bits of it: ..."ANCHOR had a few more M 2050 units it could assemble when they took the business E back from WESTRIDGE but has had to determine if the modem X has a future before they move forward...TIMEX of Portugal has out a DISK drive system for the Spectrum using the 3"

discs. The system called FDD comes ready to go with 2-RS232 ports and is available to British dealers for review; as a disk system it works very well indeed;it is to be marketed as a TIMEX product--TIMEX label--capable of using a memory card and running M, with its own Z80 processor on board. All for some 225# from Micro Matic, 84 Talbot Rd. London, England N64 RA UK Tel: 01-340-0310...". Doug Dewey gives our Wes Brzozowski much recognition for his articles and genius with the ROM-EMU plug in projects. Triangle's Doug Dewey, Dick Scoville (I have been following your MC articles with much gained from them, thank you) and Charlie Day and others have put forward much effort, talent and most precious-time! into their group and newsletter. The newsletter is well worth the subscription. Send \$10 to Doug Dewey, 206 James St. Carrboro, NC 27510.

SUM-Sinclair/Timex Magazine, 3224 Northwest 30th Ave, Gainesville, FL 32605 is now paying for articles! Their subscription list is over 500 in less than 6 months-Congrats! this reflects the quality of your material. On board latest issue is a mod to Tasword 2 to change paper + ink color, a 2068 printer IF thru the Cartridge port, and beginner's programming lessons.
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A few of us at SINCUS have been kicking around the idea of "MINI CONVENTION OF USER GROUPS" this coming August-if we can find a place-say in the Atlantic City area [buses to Atlantic City are cheap and run from just about everywhere] and as this area is fairly central to the northeast we may be able to attract users from quite a population area. I wrote in early Feb to the state and area Chambers of Commerce to get info and addresses but as yet no response. If we could get interest and \$\$\$ from dealers return for tables maybe something can come together. If I dont hear anything by end of April I'll drop this idea. Call me at 607-798-7219(evenings, no collect calls thank you) or write PAUL HILL, SINCUS, PO BOX 36, JOHNSON CITY NY 13790
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THOMAS B. WOODS, PO Box 64, Jefferson, NH 03583 is mailing his documentation for Pro/file-2068- from a couple of the members who are getting into this program-it really packs a lot of computing power into your 2068-write for catalog.

WMJ Data Systems has a quarterly publication-write WMJ, 4 Butterfly Dr. Hauppauge, NY 11788

ZEBRA has a 48 page catalog out-to get on their mail list-write to: 78-06 Jamaica Ave. Woodhaven, NY 11421

TIME DESIGNS is a new 2068-1000 bi-monthly mag-write: 29722 Hult Rd. Colton, OR 97017

FRANK LOCKHART,POB 4095, Ormond Beach, Florida 32075-4095 sends us a list of programs for the 1000 and 2068 he wrote. Engineers and mathmeticans might be interested and a couple games too!

AERCO, PO Box 18093, Austin, TX 78760 has announced their disc drives and IF for the 2068. C/PM is following soon. Price is about \$99 for IF, \$99 for 400K drives, cabinet and power supply are also \$99, total about \$300. Request details, write or call 512-451-5874.

RAMEX, 48945 Van Dyke, Utica, MI 48087 announced their disc drives and IF for the 2068. IF is \$200 and drive is about \$250 or about \$450 total-write for details.

These are the only two we know of that are offering disc systems in the US.

--SUGGESTION; if you are interested in going disc--talk to some one that owns a disc or an expert and ask questions - learn what is meant by the IF (InterFact) whether or not a drive has cables and a power supply. What software will run using that disk operaing system. Is it single sided, double sided, and what about the density and on and on--so you can understand what you are ordering and make comparisons between systems-DON'T BUY and then CRY- be an educated shopper - the cheapest might not be a bargain-nor the most expensive the best...and if you do go disc we would appreciate an article on your experiance so that others may benefit. The same applies to the microdrives.

PAUL HILL
SINCUS Secretary

MEMBERSHIP INFORMATION

Regular fulltime memberships are normally due in the month of July. The annual rate for a regular membership is \$8.00/year. The annual rate is prorated to the following July (.67 /month).

Corresponding memberships are \$8.00 per year-you will receive 12 issues of the SINCUS NEWS.

* * TELECOMMUNICATIONS * *

EASYLINK

MCI MAIL

DOH JONES

other Sinclairs

- - MTERM SMART II BUFFER - -

AERCO PRINTER I/F UTILITY PROGRAM

This is a BASIC Utility Program which is to be used with the AERCO PRINTER I/F and the MTERM SMART II MODEM PROGRAM. This program is to be used with TEXT data only, with CON:NONE and C/R SUPPRESSED:OFF. The program will allow SELECTED text which was received in the BUFFER by MTERM to be printed to an 80 column printer with the AERCO PRINTER I/F.

To install the program, ENTER the BASIC lines 1 to 360. The 1 REM must be ENTERed as shown as it will later be loaded with machine code to drive the printer. Some variables will be altered by any additions or deletions to the BASIC program and may cause unpredictable results. After the BASIC lines 1 to 360 are entered, enter "RUN 300" - this will load the print driver code into the 1 REM. "LIST" will produce an ERROR K, so use "LIST 10" to view the BASIC program. Next ENTER "DELETE 300", to remove lines no longer required. ENTER "RAND USR 26802" to store the size of the program in 1 REM. Now ENTER "RUN"-the MAIN MENU will appear. ENTER "s" to SAVE to tape. You must provide a name when prompted, I prefer "MABU" (Mterm Aerco Buffer Utility) When the SAVE is complete you are now ready to use the program.

To use the program you MUST FIRST load your MTERM SMART II CODE. Next load "MABU". Note that "MABU" MUST be loaded AFTER the MTERM SMART II. When LOAded the MAIN MENU will displayed. Enter "t" for MTERM and access your service. OPEN the BUFFER (CON:NONE and C/R must NOT be suppressed). Proceed normally and capture your text data in the buffer. At the completion of data, CLOSE the BUFFER and DISCONNECT the service. Exit to BASIC and enter "RUN". You are now using the BUFFER UTILITY PROGRAM. The MAIN MENU will be displayed. Just "tap" ENTER to begin scrolling the BUFFER data. The program will display a number each time a C/R character code is detected. Note these numbers where you wish to start and stop the printing. When the end of the buffer is reached the program will request the START number and END number. The SELECTED text data will then be printed. If the buffer listing produces an ERROR because a character cannot be displayed use CONT to continue the listing. Printing may be terminated by pressing the CAPS SHIFT plus BREAK key.

If you wish to SAVE the TEXT and the program on a tape for later printing enter "s" from the MAIN MENU and provide a name when prompted. The TEXT and program may later be loaded for printing at a later time by ENTERing LOAD **. The scroll and print options will work however the "t" option will not run MTERM unless the code is loaded as previously mentioned. The MTERM code is not necessary to print the data. Do not NEW this program and attempt to access MTERM without reloading as the buffer variables have been altered and your data will be lost.

If your printer does not space the paper up while printing then you must change the printer dip switch settings. This program Will send C/R ONLY to the printer. Consult your printer manual and set the printer for C/R only or automatic line feed.

```
1 REM #Sincus Buffer Utility#
12345678911234567892123456789312
34567894123456789512345678961234
5678971234567898
```

```
5 REM Dave Schoenwetter
1335 Farm to Market Rd
Endwell, NY 13760
(607)748-9687
```

```
10 INPUT "ENTER 'b' to BYPASS
BUFF. LIST '' 't' for MTERM or 's
to SAVE "; LINE a$
14 IF a$="b" THEN GO TO 100
15 IF a$="s" THEN GO TO 200
16 IF a$="t" THEN PRINT USR 54
016
20 LET s=PEEK 26816+256*PEEK 2
6817
30 PRINT INVERSE 1;s;" START
OF BUFFER."
40 LET t=PEEK 23627-1+256*PEEK
23628: PRINT INVERSE 1't;" EN
D of BUFFER "
50 FOR f=s TO t
52 PRINT CHR$ PEEK f;
54 IF PEEK f=13 THEN PRINT , I
NVERSE 1;f
56 NEXT f
58 PRINT INVERSE 1't;" END OF
BUFFER "
100 INPUT "ENTER START LINE # "
;s: PRINT "START AT ";s
110 LET h=INT (s/256): POKE 267
40,h
120 LET l=INT s-h*256: POKE 267
39,l
150 INPUT "ENTER END LINE # ";t
: PRINT "END AT ";t
160 LET h=INT (t/256): POKE 267
43,h
170 LET l=INT t-h*256: POKE 267
42,l
180 PRINT USR 26738
190 GO TO 10
200 INPUT "ENTER NAME to SAVE D
ATA & PGM. "; LINE a$
205 SAVE a$ LINE 210: STOP
210 POKE 61166,96
220 RANDOMIZE USR 26808: RUN
300 RESTORE 340
310 FOR n=26738 TO 26814
320 READ x: POKE n,x
330 NEXT n
340 DATA 33,0,0,1,0,0,3,125,185
,32,4,124,184,40,34,62,127,219,2
54,31,48,27,219,127,230,16,32,24
3,126,254,10,32,2,62,0,254,12,32
,2,62,0,211,127,0,219,127,35,24,
214,6,0,61,32,253,16,251,62,13,2
11,127,0,219,127,201,42,75,92,34
,192,104,33,192,104,34,19,211,20
1
360 STOP
```

THE INTERFACE ZERO:

Adding Microdrives to your 2068

by Wes Brzozowski, SINCUS

It took a long time for those in the sport of running to first break the four minute mile. Until it actually happened, there were those who actually considered it impossible. Once done though, the feat was repeated again and again until today, where the act is almost commonplace.

This microdrive interface is not the first. As in the example of the four minute mile, it follows on the heels of the success of others. But the "state of the art" is still in its infancy. This interface includes some features not found in earlier designs and those new features will hopefully keep it from being grouped among the "also rans".

We'll see.

One thing it has in common with all of its predecessors is that it's an excellent way to destroy an expensive computer through a careless mistake. If you want to build this or any other microdrive interface, then for heaven's sake, BE CAREFUL!

For those looking for a bit of background, Sinclair's ZX Microdrive is a small closed loop tape recorder that runs very VERY fast, in comparison to cassettes. Sinclair tries to compare them to floppy disks, but your friends with Apples or IBM PCs would find the comparison amusing, so don't take it too seriously.

TIMEX had planned to introduce microdrives for the TS2068, but never got around to it. The Sinclair microdrives are intended only for use with the Sinclair Spectrum, and then only when plugged into another peripheral called Interface One. (Sinclair has also sold an unrelated gadget called the Interface Two, but they try not to call attention to the fact! Now do you see how this article got its name?)

Unfortunately, the Spectrum Interface One will not get along unaided with a TS2068. When Sinclair designed the Spectrum, its rear connector signals got arranged quite differently from its predecessor, the ZX-81 (that's like the TS1000, for you new kids.) TIMEX's design included an attempt to put things back the way they were, to allow for compatibility with more types of peripherals (the modem, for instance). Furthermore the use of newer memory technology allowed TIMEX to discard some of the Spectrum power supply voltages; they're not at the rear connector at all.

There are more problems. Differences in ROM code cause several conflicts, particularly in the ways RAM is allocated. TIMEX's addition of bank switching capabilities complicates certain memory control problems. Lastly, Sinclair has not completely decoded the Interface One I/O ports. Because of this, use of the TS2068 ports for joysticks, sound, and bank switching might inadvertently mess up the microdrives.

Although the INTERFACE ZERO is an electronics project, it might be more aptly described as an exercise in advanced art of macrame! This is because the wires between the TS2068 and INTERFACE ONE connectors zig-zag around so. Nazir Pashtoon of the L.I.S.T. group calls his interface the "twistor". Only after actually playing with the interconnections can one understand how appropriate the name is. (If you've read this far,

you'll probably be interested in Mr. Pashtoon's excellent articles on the subject. They're in the December and February newsletters from L.I.S.T. Check the club library.) In any case, if your soldering skills could do with some improvement, you might want to get some more practice before starting a project like this one. Remember, if anything burns up, you're on your own!!!

Before starting, you'll need some sort of Spectrum Emulator. This circuit has been tested and works with Doug Dewey's EMU-1 emulator, which he'll be glad to sell you. Of course, it also works with my "Extra Simple Spectrum Emulator", SINCUS NEWS, Feb 1985. If you'd rather build one on the INTERFACE ZERO board rather than on a cartridge board, please first see "UPDATES" in the TIMEXly Tips Section following this article.

The INTERFACE ZERO plugs between the TS2068 and the Sinclair INTERFACE ONE. Taking a look at the INTERFACE ONE, we see that its female input connector angles downward rather sharply. This is because the unit was intended to be permanently screwed to a Spectrum, and give it a downward slope, somewhat like a typewriter keyboard. While this is all very nice for a Spectrum, it means that you'll have lots of trouble extending a rigid circuit board between it and your TS2068.

I'd suggest that the board of INTERFACE ZERO circuitry be firmly attached to the female TS2068 connector, while the male connector to the INTERFACE ONE be attached at the end of a 5 - 6 inch ribbon cable. Because of the large number of connections involved, multicolored ribbon cable is well worth the extra expense. The connector pinouts in the diagram were laid out to give you sufficient room to write in the color of each wire. Note that the insulation of some ribbon cables will curl back when the wire is soldered.

By the way the TS2068 takes a double sided, 64 pin female edge connector with .1 inch spacing between the pins. Note that the most commonly available edge connectors have a different spacing, so check carefully, before you buy. It would be a good idea for you to remove two of the pins and glue in a plastic key to match the slot on the TS2068 board. The INTERFACE ONE takes a double sided 56 pin male edge connector (I used a piece cut off of a scrap P.C. board) with a slot sawed through the proper pin to accommodate the key on the INTERFACE ONE connector. The spacing here is also .1 inch. Those who plan to raid their "junk boxes" for parts may proceed to do so. It should be perfectly O.K. to pervert a TS2068 prototyping board for the task, but be careful to get one that handles a full width TS2068 connector. Some "TS2068 Prototyping boards" are only as wide as a TS1000 connector, and they can't contact all of the necessary pins.

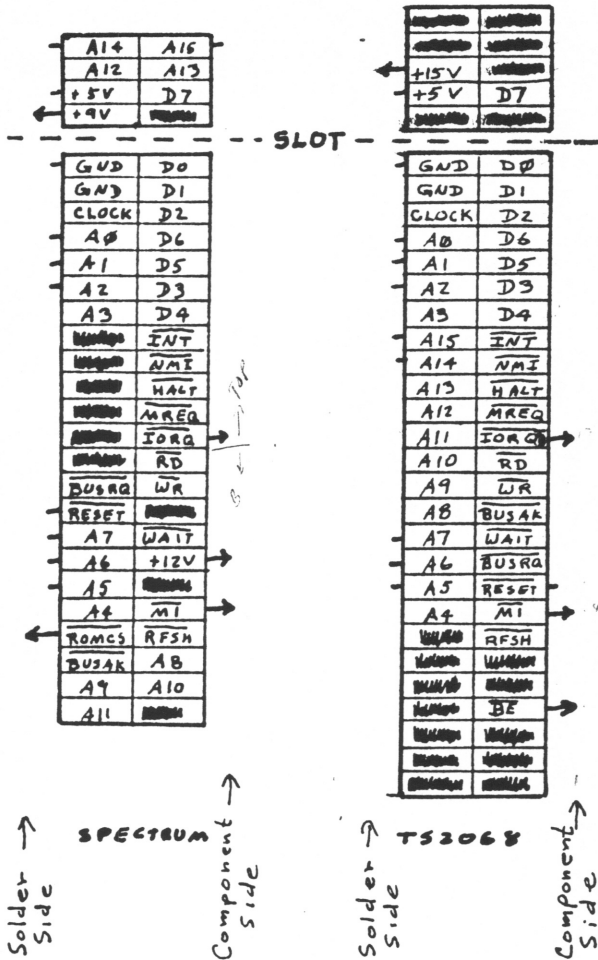
An explanation of the two connector pinouts is in order. Both TIMEX and Sinclair prefer to show the locations as if you were viewing the female connector. This means that the picture shown may be a mirror image of what you'd prefer. Be sure to note which are the solder and component sides, and where the slot is, and you shouldn't have any trouble.

17-0317/2 2068

2068 INSTRUCTIONS
SPEC REFLECT/D

REAR CONNECTORS

(Viewing the mating female Connector)



-W. Brzozowski 3/2/85

- NAME - Wire to both connectors only
- NAME → - Wire only to schematic
- NAME ← - Wire to connectors and schematic
- NAME - Do not connect

My diagrams also group the pins into four different types. Some just have signal names, some also have small lines coming out, some instead have arrows, and some are completely black. The black pins should not have any wires attached to them when constructing this project. The pins with names but neither lines nor arrows should be connected directly to the pin of the same name on the other connector. The pins with lines coming out go directly to the other connector, but also go to the accompanying schematic diagram. The pins with arrows coming out don't go to the opposite connector at all; they only go to the schematic diagram. I know these directions are complicated, but please be sure you understand them completely before you plug in your soldering iron. Mistakes can be costly!

One very important tip in construction is to make sure that you have some way of physically securing all wires to the connector in addition to their electrical connection. They must be secured so that even when the ribbon cable is flexed, the wires will not move at the points where they're joined to the connector pins. If this isn't done, then moving the ribbon cable will eventually cause wires to break off at the connector. Since the INTERFACE ONE is not cheap, you don't want to risk damaging it with a short circuit, or just having the headache of an unreliable microdrive system. Coming up with a good way of physically securing everything probably delayed my project by a day or two, but it was worth it.

When it's wired up, except for the regulators, and before inserting the chips in their sockets (don't build it without sockets!!!) check for shorts on adjacent connector pins with an ohmmeter. Next, check for continuity on all connections. This done, insert the chips and regulators, plug it all into your TS2068 and "fire it up" (hopefully, without a real fire)! Make sure you get the copyright message and check the regulator voltages. The 7812 should give 12V and the 7806 with the resistor in its common lead should give somewhere from 8 to 10 volts. Shut it off again.

Now it gets interesting. Plug in the INTERFACE ONE, but without the microdrive, for now. Make sure the switch is in the Spectrum position, and make sure your Spectrum Emulator is in place. Bring it up in the Spectrum mode, or in the case of my "Extra Simple, etc.", type in the commands that will switch it to the Spectrum mode. When you get the single copyright message, type CLS # and press ENTER. Normally, this is improper syntax, and the machine won't accept it. If the INTERFACE ONE is working, however, it will be recognized as a new BASIC command, and will give you an "O.K." message.

Now for the moment of truth. Shut it down, plug in the microdrive and bring it all back up in the Spectrum mode. Insert a BLANK microdrive cartridge (no need to risk ruining any of the nifty software that comes with your hardware), press RUN and then ENTER. If the microdrive light comes ON and you get the message "Microdrive Not Present" then CONGRATULATIONS! You've done excellent!! It's time to insert one of the programs they've given you, go into fits of ecstasy from the rapid loading, and start sneering at your old cassette recorder. Your computer will never be the same!!

So why another microdrive to TS2068 interface? Why not use one of the other published circuits? You can. They're simpler, but in some ways they're less versatile.

With this circuit, for the first time, the INTERFACE ONE won't interfere with the computer when it's operating under the TIMEX ROM, and the I/O ports that TIMEX added won't confuse the microdrives. (In this case, the switch should be in the TS2068 position.) None of the commands for the microdrives work in this mode, but I've been able to get the microdrives light and motor to come on, giving hope that the proper software can be developed.

This circuit will also be compatible with the memory expansion banks I'm developing. (An ideal place for the microdrive software, come to think of it.) An arbiter to prevent the INTERFACE ONE and the expansion banks from conflicting can be readily added though the connections labeled "for future expansion".



The circuit works fine both with the EMU-1 and my "Extra Simple Spectrum Emulator". Since it successfully uses the BE line, it will probably also work with a ROMSWITCH, or with a Spectrum ROM plugged into the TS2068 board, but these haven't yet been tried.

A quick explanation of the circuitry is in order. The INTERFACE ONE contains its own ROM, which it pages into the lower 8K of memory when an instruction is executed from memory location 0008. It "observes" this when the address bus contains 0008, MREQ is in low, and MI is low. With the switch in the TS2068 position, it never sees MI going low, and so, it is effectively disabled. This is necessary when the TIMEX ROM is active, since they're not compatible. As such, our own machine code may someday be able to control the microdrives when the computer is in the TS2068 mode.

If the switch is in the Spectrum mode however, (a Spectrum emulator should also be active, in this case) the above situation will cause ROMCS on the INTERFACE ONE to latch high. In a "real Spectrum" this merely "shuts off" its internal ROM, allowing the INTERFACE ONE ROM to take control. Since we don't have ROMCS on the TS2068, we use BE, which disables all memory when pulled low. Since we only want it to disable the ROM, we introduce additional address decoding so that BE is only low when the address bus points to the ROM. Using line A13 is unnecessary, since the INTERFACE ONE normally disables the whole 16K Spectrum ROM, even though it only replaces 8K. Including MREQ in the decoding is not only unnecessary, but it will also cause BE to go active one half clock cycle later. Depending on how much extra leeway is allowed in the computer's memory timing, this may be unacceptable. As it is now, BE goes active long before the memory can ever be enabled, so we don't have to concern ourselves with this unknown timing specification.

The 1K pulldown resistor on ROMCS is there because ROMCS is normally either high or in the high-impedance state. To a normal TTL circuit, this always appears to be high. Unfortunately, pull-down resistors are not as general purpose as pull up resistors. The value used depends on the number and type of TTL gates connected to the point. (Although we try to hide the fact, digital electronics still has an analog side.) Unless the resistor is made somewhat smaller, we can't guarantee that the circuit will work if more than one additional LS-TTL load is attached there, so BE CAREFUL if you're planning additional modifications.

The 74LS30 and LS04 combination maps the INTERFACE ONE only into ports F7 and EF, which are all they need. (Port E7 is also mapped in by this circuit; but don't use it!) It turns out that Sinclair has the disgusting habit of only decoding a single bit in its I/O ports, so that a single port will erroneously respond to many port numbers! TIMEX corrected this in the TS2068, and assigned many such numbers to new functions that they added! The new I/O map accommodates this by selectively gating out IDRQ.

Unfortunately, this means that any other Spectrum peripheral plugged into the back of the INTERFACE ONE won't get the proper I/O signals, unless you run the IDRQ to it from the TS2068. This is sad, but the intent of this circuit is to provide an environment that tolerates the presence of the INTERFACE ONE, no matter what. (If you take a close look at the low quality connector built into the INTERFACE ONE, you'll never after hesitate to unplug it.)

The reset button is just a handy thing to have, as long as you're putting in some wires. Note that it won't work with an EMU-1 active, since RESET causes code to be executed starting at memory location zero. The EMU-1 EPROM doesn't contain executable code at this point. Doug Dewey tells me that his OMNI-EMU can be outfitted with a Spectrum ROM. The reset switch should work with this, or any other emulators based on an actual Spectrum ROM. (But I've only actually seen it work with my "Extra Simple...etc").

The regulators are just that. They provide some of the Spectrum voltages absent at the TS2068 connector. The 680 ohm resistor under the 7806 is a kludge that turns a 6 volt regulator in something like a 9 volt regulator. If you can obtain a 7885 (8.5 regulator), you can probably get rid of the resistor, and try this instead.

The resistor marked "see text" has yet to be determined. A simple wire will work, but the regulator will run a little hot. When a manufacturer rates a regulator at one amp, this is usually just clever specsmanship. That one amp is valid only under ideal conditions (infinite heat sink, minimum input output differential voltage, etc.) that you can't possibly duplicate. As such, an additional one or few tens of ohms may help keep things cooler. Since I haven't yet come up with a good value, I won't give any numbers, yet. But, I'll tell you what works for me if you'll tell me what works for you! The cooler the regulator, the greater the chance it'll keep working. If someone out there has the spec. for the motor current we can probably solve this once and for all. In any case, this like all "Spectrum adaptor" circuits, is still experimental. It works beautifully, but it may yet need some fine tuning.

This article is not copyrighted. You are free to build 1 or 1000 of this gadget. If anyone wants to sell them I'd appreciate you sending me one or two units as a courtesy, but you are under no obligation to do so. I'd like to hear from any and all folks who'd like to swap ideas!

PLEASE SEND YOUR QUESTIONS OR COMMENTS TO ME

Wes Brzozowski
337 Janice Street
Endicott, New York 13760

PLEASE enclose a stamped, self addressed envelope if you wish a reply. I'd also be pleased to speak to you on the phone (607) 785-7007, as long as you call, don't call collect, and call before 9:00 P.M. Eastern time. Stay tuned to this space for future developments!

WES BRZOZOWSKI

ADVERTISING RATES

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ADVERTISING RATES

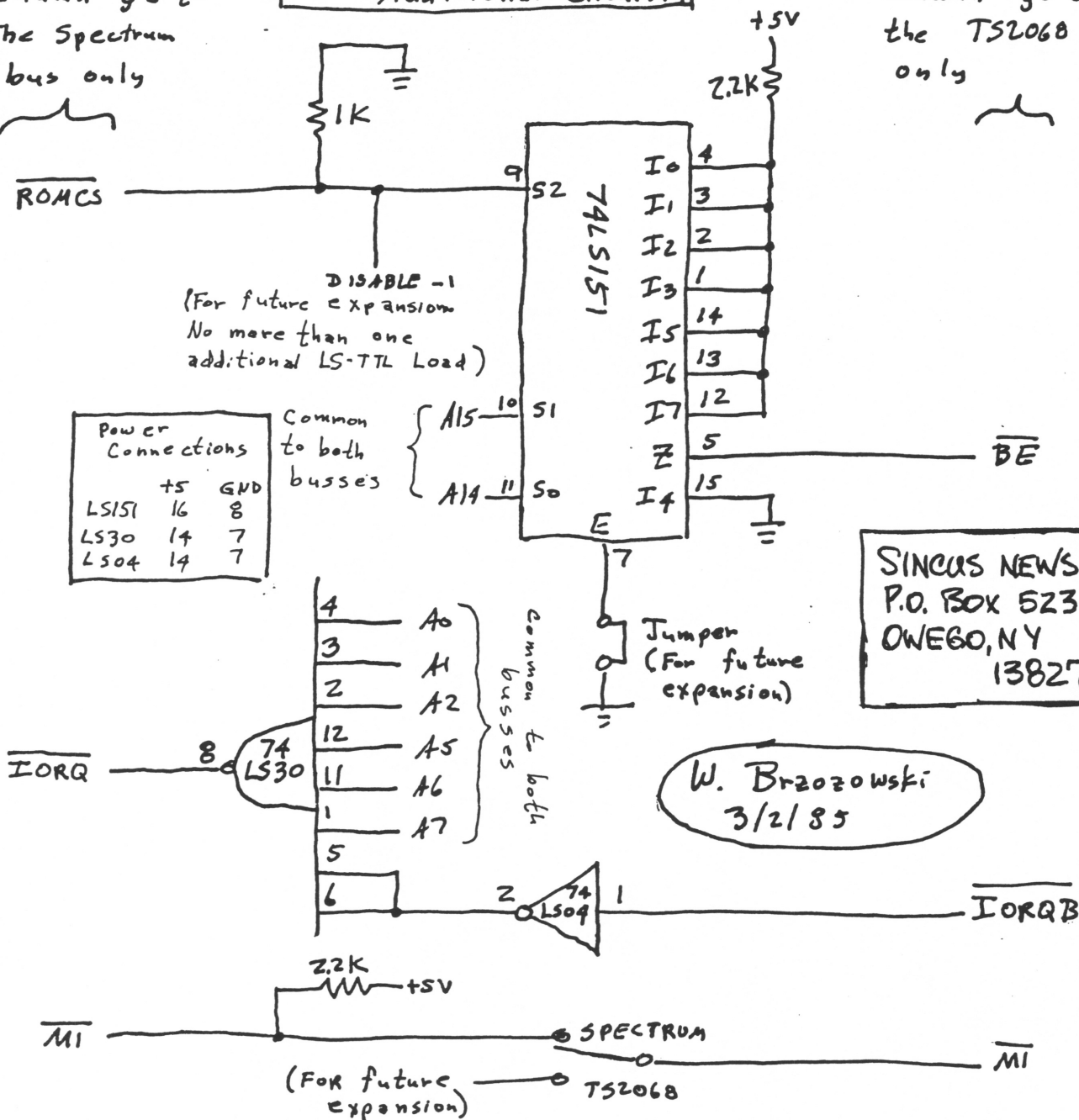
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Signals in this column go to The Spectrum bus only

INTERFACE ZERO
- Additional Circuitry

Signals in this column go to the TS2068 bus only

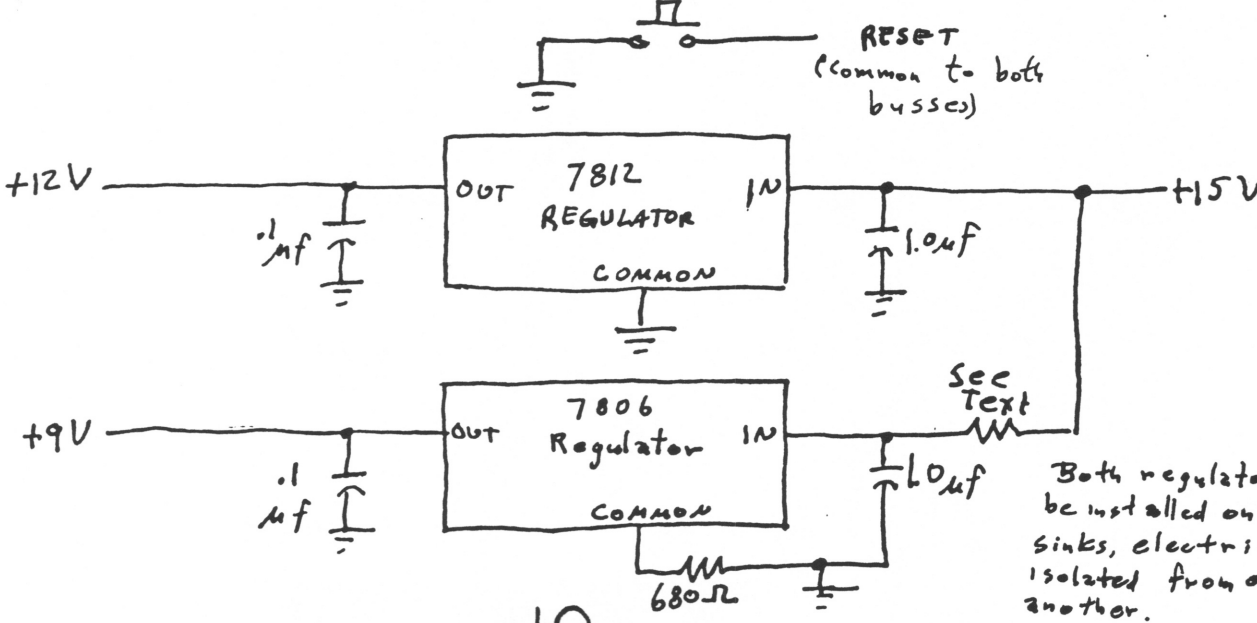


Power Connections

	+5	GND
LS151	16	8
LS30	14	7
LS04	14	7

SINCUS NEWS
P.O. BOX 523
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W. Brzozowski
3/2/85



TIMEX ^{ly} TIPS

UPDATES

by WES BRZOZOWSKI, SINCUS

Anyone who hesitated to build my Universal LROS/AROS Development Board, (SINCUS NEWS, Nov. 1984), because of the cost may want to look again. Although it can run with 2764 EPROMs (or 8264 EEPROMs, if you're rich) its real power is shown when it's run with 6264 RAMs. In the LROS mode, you can load in the Spectrum ROM code and have a Spectrum emulator and even modify the Spectrum code! In the AROS mode, you can load in HOT Z-AROS, and run it from the cartridge bank. (Ray Kingsley had no objection to selling me a tape of the code.) It will also be useful in determining how to switch some of your favorite programs to EPROM cartridge. (In coming months, we may get around to showing a neat trick that will often allow it to be done with little pain.) In any case, the 6264LP-15 RAMs can be obtained for only about \$13 each (you'll need two) from Microprocessors Unlimited, 24000 South Peoria Ave., Beggs, OK 74421. Shipping is extra and they take Mastercard and VISA. Now that the chips only cost about a third of what they did a few months ago, the time is right!

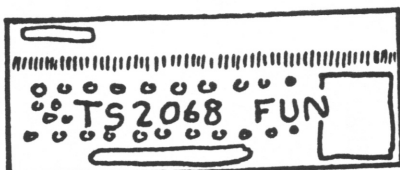
Last time, I mentioned that my "Extra Simple Spectrum Emulator" could be built either on a cartridge or on a board plugged to the rear connector. This is true, but if you build it as is to the rear connector, it will prevent any other cartridge from working properly, should you plug one into the cartridge port. If you include a switch to disconnect the RDSCS signal and put a pullup resistor on pin 20 of the Spectrum ROM, you should be able to disable the Spectrum ROM by opening the switch. Keep the wire lengths as short as possible! Now the cartridge will work.

Wes Brzozowski
SINCUS

```
50 PEEK "T/S 2068"-Valentine
   "invert"
52 PEEK John Colonna, SINCUS
55 PEEK USE "GO TO 95 to return
   to normal characters"
   USE "GO TO 70 for the
   inverted set"
60 CLEAR 20000
65 LET c=PEEK 23606+256*PEEK 2
3607+256
66 FOR j=0 TO 95
67 FOR p=0 TO 7
68 POKE 30000+7-p+8*j,PEEK (c+
p+8*j)
69 NEXT p: NEXT j
70 POKE 23606,48: POKE 23607,1
16
80 STOP
95 PEEK recovery
97 POKE 23606,0: POKE 23607,60
99 STOP
```

```
20 PEEK "T/S 5028"-A916UfTU6
   "TUASLr"
25 PEEK John Colonna, SINCUS
22 PEEK USE "GO TO 82 to return
   to normal characters"
   USE "GO TO 30 for the
   inverted set"
80 CLEAR 50000
82 LET c=BEEK 53000+520*BEEK 5
3001+520
83 FOR j=0 TO 82
84 FOR b=0 TO 3
85 POKE 30000+3-b+8*j,BEEK (c+
b+8*j)
86 NEXT b: NEXT j
30 POKE 53000,48: BOKE 53001,1
16
80 210b
82 PEEK LSC0ASLA
83 BOKE 53000,0: BOKE 53001,00
84 210b
```

TR9UK2' 70PU111



We will exchange newsletters, but we will terminate the exchange if we do not receive some correspondence in return every ninety days - this applies to commercial businesses giving this news letter. We urge commercial businesses to welcome corresponding members.

Any and all correspondence, articles, and advertisements should be submitted to:

Gary Ennis, Editor
SINCUS NEWS
P.O. Box 523
Owego, New York 13827

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